

SOUTH FREMONT / WARM SPRINGS AREA STUDIES



LAND USE ALTERNATIVES

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South Fremont / Warm Springs Area Studies

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With Tesla now occupying 5.4 million sf of the old NUMMI plant, there is tremendous potential for the future of South Fremont/ Warm Springs to become a place of innovation.

1. OVERVIEW

The Land Use Alternatives Study summarizes potential land use scenarios for 850 acres of industrial land in the South Fremont/Warm Springs area of Fremont. The Study is the product of one of four inter-related studies for the area, consisting of an economics and market analysis; land use alternatives; infrastructure/transportation and cost analysis; and financial assessment.

Under separate cover, the baseline market analysis, summarized in the Economics and Market Analysis Strategic Plan report, serves as the basis for the land use alternatives discussed below. In addition, three memos (included in the Appendix) describe the existing land use, transportation and infrastructure conditions in the area, providing pertinent information on the Study Area's character, conditions, opportunities and constraints.

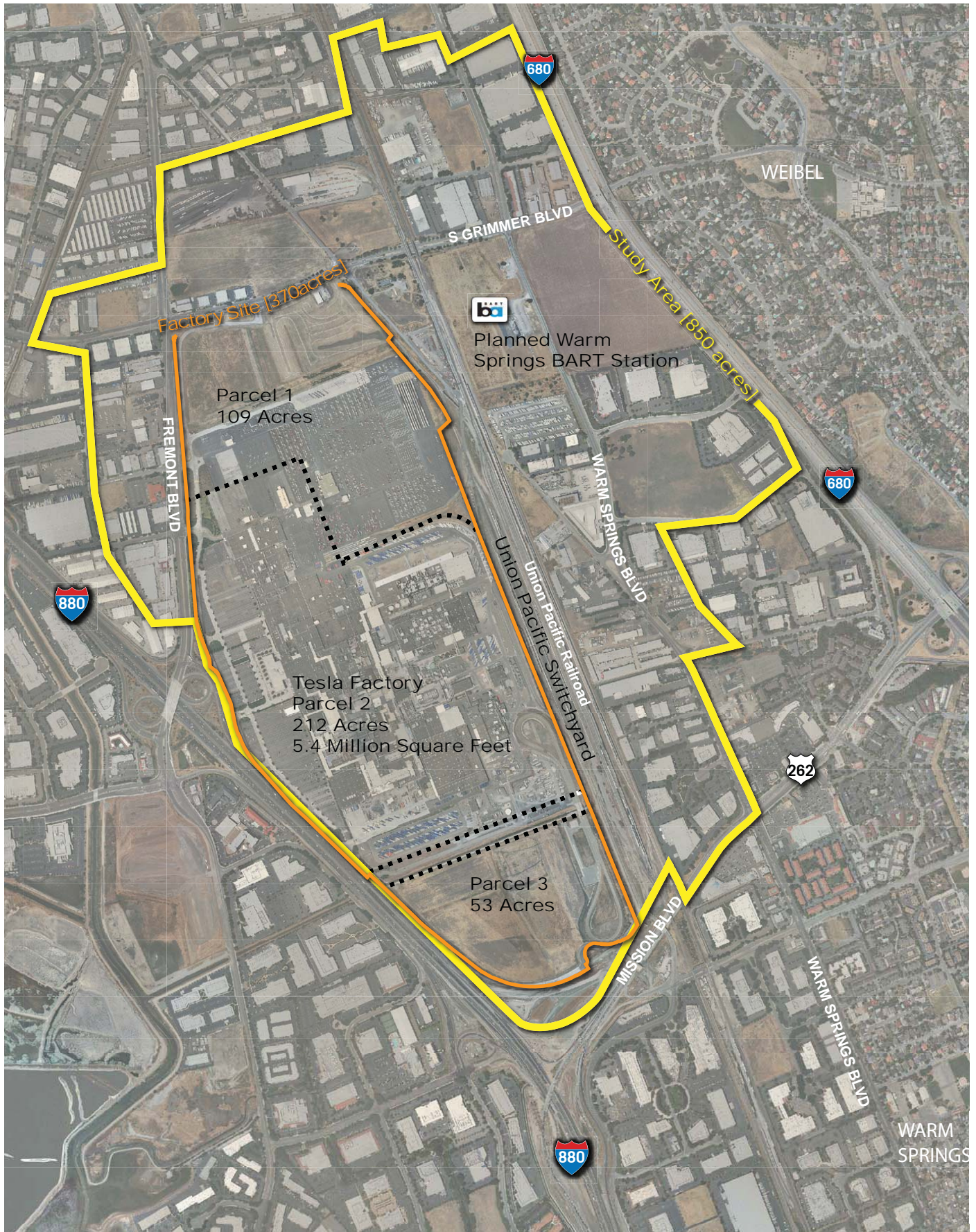
Background and Approach

With the impending closing of the 5.4 million square foot NUMMI plant in April 2010, the City of Fremont applied for and received a \$333,000 grant from the U.S Department of Commerce Economic Development Administration (EDA) to develop a Recovery Strategy for the site and the area surrounding the future Warm Springs BART Station. This Land Use Alternatives Study, and the other EDA-related studies described above, constitutes this effort. This Study identifies a range of land use alternatives; it does not recommend a preferred alternative nor result in a detailed plan. The studies, in total, will inform the Warm Springs Community Plan, anticipated to occur upon completion of this effort.

The one and one-half year long planning effort included a community survey, four community workshops/presentations, and multiple work sessions with City Council to understand goals for the area, discuss findings (including presentations of market conditions and advice from an "Expert" Panel on innovative industries), and consider alternative land use scenarios. The effort also included workshops with the Planning Commission and the Economic Development Advisory Commission. The three alternatives developed for the Study Area reflect the goals, as derived from the community survey, community workshops, City Council, Planning Commission, and the Economic Development Advisory Commission; findings from the existing conditions analyses and Expert Panel; and the application of land use/urban design "best practices."

The three alternatives were refined to reflect findings from the transportation and infrastructure impact analyses and a financial assessment study. With direction from City Council, the alternatives were finalized in late 2011.

Figure 1.1: South Fremont/Warm Springs Study Area



Study Area

Illustrated in **Figure 1.1**, the South Fremont/Warm Springs Study Area is approximately 850 acres in size, inclusive of the 212-acre Tesla factory. Described in detail in the existing conditions memos (see Appendix), salient features of the site include:

- **Industrial Land Use.** The Study Area contains one of the largest contiguous industrial areas left within the Bay Area. It includes a rail switchyard east of Tesla factory, operated by Union Pacific Railroad, which will likely remain in active use. Such industrial uses raise questions about the suitability and compatibility of introducing non-industrial uses, such as residential, into the area (discussed below).
- **Former NUMMI Site/Tesla Factory.** Closed in April 2010, the New United Motor Manufacturing, Inc. (NUMMI) automobile plant site consisted of three parcels. Parcels 1 and 3 are vacant and available for development (although purchased by Union Pacific Railroad in late 2011). In October 2010, Tesla Motors took possession of Parcel 2, and its 5.4 million square foot factory, for development and production of its electric vehicles, specifically its Model S sedan, and EV powertrain components. The new Tesla factory establishes an anchor in the area and creates potential synergies for other innovative industries.
- **Planned BART Station.** The planned Warm Springs BART Station and extension line, now under construction, enhances access to the area and provides potential for a residential-focused or jobs-focused Transit Oriented Development (TOD).
- **Transportation Access.** In addition to the planned BART station, Interstates 880 and 680, Mission Boulevard and Union Pacific Railroad tracks provide excellent access to the Study Area. However, these transportation conduits create edges and barriers for connections across the site and to adjacent areas. Other major vehicular routes include Fremont Boulevard, Grimmer Boulevard and Warm Springs Boulevard, which provide direct access to the planned BART station.

Three Land Use Alternatives

The three land use alternatives are meant to be forward looking, setting the stage for innovative and “next generation” commercial and industrial enterprises and mixed-use residential neighborhoods as warranted by market and other factors. The alternatives look to capitalize on the availability of the regional transportation facilities and an educated and skilled workforce to create opportunities for job growth. They retain varying degrees of industrial use while creating opportunities for other innovative high-tech and R&D enterprises, including, in some cases, high-density residential neighborhoods.

All of the land use alternatives incorporate the following elements:

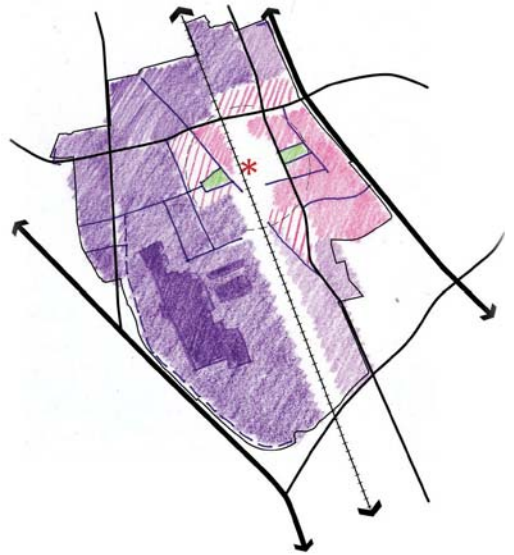
- Intensification/Integration with the Planned BART Station. All of the alternatives recognize the importance of the planned BART station by focusing and integrating higher intensity land uses, bike/pedestrian linkages and open space amenities within a ½ mile of the station.
- Industrial Uses while Allowing For Other Uses. All of the alternatives retain significant areas for industrial-only land use, including the Tesla factory, while emphasizing mixed-use commercial and/or residential zones nearer the planned BART Station.
- “Blended” Commercial/Industrial Land Use Category. All of the alternatives introduce a new “blended” commercial/industrial land use category, in addition to using the City’s land use categories (from the draft General Plan 2030). The new blended category allows for office and/or research and development (R&D), accommodating a wide variety of creative enterprises and activities.
- Buffers to Residential Uses. The alternatives incorporate non-industrial uses, such as commercial uses or commercial/R&D, as a buffer between industrial uses and residential uses, if residential uses are introduced (i.e. Alternatives 2 and 3). This protects both job-producing industrial uses, which can also generate traffic, noise and other hazards, and new residential neighborhoods.
- “Place-Making” and High-Quality Public Realm. While this study focuses on land uses, the success of the area and the ability to retain and attract innovative businesses will rely on the quality of the built environment, in particular the quality of the public realm (streets and open space), the overall pedestrian orientation, and the synergistic mix of uses. Discussed as broad principles below, this is particularly true for the area nearest the planned BART station.

Discussed in greater detail later in this study, the three land use alternatives depict a range of land use scenarios, from all industrial/commercial use to industrial/commercial use with residential infill. All the alternatives can accommodate “special uses,” such as community and convention facilities. The three land use alternatives are:

- Alternative 1: Innovation Center/Manufacturing
- Alternative 2: Innovation Campus/Residential TOD
- Alternative 3: Innovation District/Residential Mixed-Use

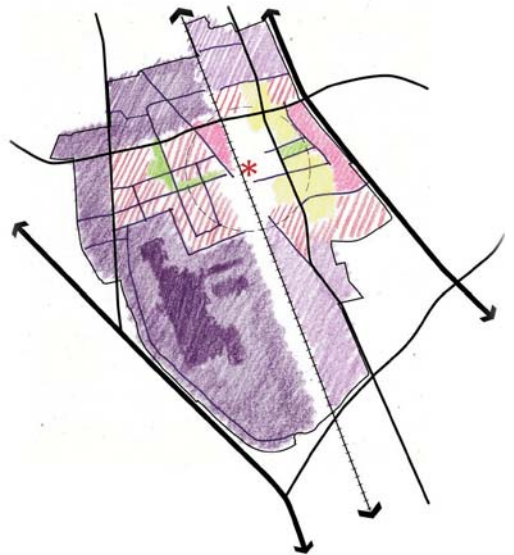
Alternative 1: Innovation Center/Manufacturing.

This alternative retains the Study Area for industrial and commercial uses, with a commercial district and jobs-focused TOD at the planned BART station.



Alternative 2: Innovation Campus/Residential TOD.

This alternative establishes a large innovation campus, with a mix of commercial and R&D uses, west of the planned BART Station and a high-density residential-focused TOD east of the station.



Alternative 3: Innovation District/Residential Mixed-Use.

This alternative provides the most housing, with two high-density residential neighborhoods both west and east of, and closely integrated with, the planned BART station. It includes a concentration of retail uses at the corner of Grimmer and Fremont Boulevards.

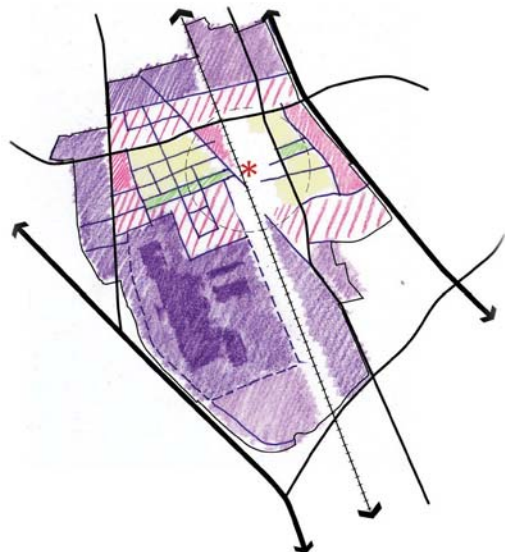








Table 1.2: Land Use Goals and Objectives

	<h3>Community Quality of Life</h3> <p>OBJECTIVES</p> <ul style="list-style-type: none"> • Contribute to the City's overall quality of life • Maintain the viability of both residential neighborhoods and commercial/industrial uses • As appropriate, incorporate buffers (landscaping, building setbacks and orientations, walkways, streets, etc.) to help provide separation between residential/mixed-use developments and manufacturing, industrial, research and development, and other employment generating uses
	<h3>Connections</h3> <p>OBJECTIVES</p> <ul style="list-style-type: none"> • Enhance non-vehicular connections, in particular pedestrian and bicycle paths. • Include safe and convenient pedestrian and bicycle connections to the planned BART station and other key destinations. • Establish new street connections to promote a well-connected street network within the plan area. • Encourage safe and efficient bus transit circulation that increases that area's transit accessibility.
	<h3>Economic Sustainability</h3> <p>OBJECTIVES</p> <ul style="list-style-type: none"> • Enhance the economic base of the City of Fremont • Encourage uses that increase employment and the City's tax base • Encourage uses that optimize market dynamics and long-term opportunities for Fremont, Silicon Valley and Northern California • Revitalize and expand industrial and commercial opportunities
	<h3>Environmental Sustainability</h3> <p>OBJECTIVES</p> <ul style="list-style-type: none"> • Incorporate sustainable design principles, including reuse of existing structures where appropriate and use of passive storm-water retention and filtration systems, green buildings, walkable and mixed-use developments and energy efficient systems. • Consider a higher intensity of uses with ¼ mile of the BART Station
	<h3>Future BART Station</h3> <p>OBJECTIVES</p> <ul style="list-style-type: none"> • Leverage the planned Warm Springs BART Station, locating a variety of high density uses, which may include housing, high intensity commercial and employment centers • Establish a Transit Oriented Design (TOD)-based land use plan that seeks to create jobs on the site and support businesses in the vicinity.
	<h3>Job Retention and Creation</h3> <p>OBJECTIVES</p> <ul style="list-style-type: none"> • Retain and enhance the existing job base • Attract a high number of high paying jobs, particularly those with long-term potential • Emphasize emerging technology, manufacturing and professional jobs • Promote employment generating opportunities

Land Use Goals

The three land use alternatives are based on the goals for the Study Area established by the City Council. Summarized in **Table 1.2**, the goals fall into six broad categories:

- Community Quality of Life
- Connections
- Economic Sustainability
- Environmental Sustainability
- Future BART Station
- Job Retention and Creation

The land use goals for the Study Area are consistent with and further the vision of Fremont’s draft General Plan 2030. In the draft General Plan 2030, it is the City’s vision that over the next twenty years, Fremont becomes a national model on “how the auto-oriented suburb can evolve into a sustainable, strategically urban, modern city.” The draft General Plan 2030 focuses on creating more resident workforce by increasing the number of jobs within the City and maintaining a diverse population through development of a wider range of housing options, including more pedestrian-oriented commercial districts and downtown character. The City also envisions a “greener” future by reducing solid waste production, creating a stronger network of bike and pedestrian systems, and meeting climate change objectives and policies.

2. LAND USE CONSIDERATIONS

The Study Area, an industrial area with a variety of production, manufacturing, and warehousing businesses, as well as vacant land, offers unique challenges and considerations when planning for improvements, “next generation” enterprises, and mixed-use neighborhoods. Land use considerations in the area include:

- Intensive Industrial Uses
- Compatibilities and Adjacencies
- Industrial, Railroad and Freeway Buffers
- Vacant and Underutilized Lands
- TOD at BART
- Residential Uses – Critical Mass

Intensive Industrial Uses

The Study Area contains one of the last large and contiguous industrial areas within the Bay Area. Well served by existing infrastructure and utilities, it has direct or convenient access to several railroads, freeways, ports, and Bay Area airports, which makes the area ideal for industrial and warehouse uses. Careful consideration should be given to the introduction of activities that could impair existing industrial operations or create future land use conflicts. As important, many industrial uses create noxious side-effects, including noise, dust, truck traffic, rail traffic, and hazardous materials, which are incompatible with some non-industrial uses, including those involving sensitive populations (e.g., children, elderly).

The draft General Plan 2030 Land Use and Economic Development Goals and Policies include the following:

- Ensure that adequate industrial land is available to accommodate a wide range of industrial uses, including those with intensive operations.
- Protect industrial areas from encroachment by activities that would impair operations, prevent operations expansion, or create conflicts with non-industrial uses.
- Limit large-scale, regional retail uses and shopping centers in industrially zoned areas.
- Ensure that uses that are potentially incompatible with industrial are not permitted (or are conditionally permitted, as appropriate) in the City’s general industrial zones.
- Emphasize that industrial businesses have the exclusive right to operate as allowed by the district. Non-industrial uses proposed that would limit industrial operations shall not be allowed to locate in industrial zoned areas.

In consideration of the land uses, there is an effort to retain a majority of the industrial use within the Study Area, while allowing for variations in the amount of commercial and residential introduced into the area. In addition, the alternatives recognize that Union Pacific’s rail switchyard, located adjacent to and east of Tesla Factory, will likely remain in active use and include a minimum 15-acres of rail-related uses on Parcel 1.

Compatibilities and Adjacencies

Industrial uses create opportunities and challenges for adjacent uses. Adjacent industrial uses can provide supporting services to other industries in the area, share similar “noxious” side-effects, and are compatible with and dependent on the intensive industrial operations and supportive ancillary uses in the area (e.g., railyards, freeways). Related industries can also have a synergistic impact on one other, creating “hubs of innovation.” Silicon Valley itself is one such example.

Tesla Motors, and its innovations in electric vehicle manufacturing, is a compelling anchor in the area for other innovative and related industries. In general, many uses benefit from co-locating with each other, such as R&D (research and development) facilities with commercial office or a technical high school. Using Tesla as a starting anchor for the Study Area, Fremont has the opportunity to create a multi-use “tech zone” similar to Chicago’s stockyards, the Porsche factory in Stuttgart, Germany, or China’s modern industrial parks. While the Tesla factory may be a compelling anchor, care should be taken to allow for a diversity of industrial and commercial enterprises.

In addition to land use compatibilities, other challenges in the area include the railroad track which effectively divides the Study Area in half. While the railroad is greatly beneficial for certain land uses, such as manufacturing and distribution, the tracks may create a divide if, in the future, the entire Study Area is envisioned to take on a more integrated land use strategy.

Industrial, Railroad and Freeway Buffers

Industrial uses may have operational characteristics that may be incompatible with non-industrial uses, particularly those with sensitive users (e.g., children, elderly). Other considerations include hazards related to active rail yards and air quality from freeway traffic. Buffers can protect and minimize such hazards and may take the form of other land uses, such as commercial, R&D, and open-space corridors. In the alternatives described below, the buffers take the form of commercial office and/or commercial/industrial R&D to create a transition between housing and byproducts generated by industrial uses.

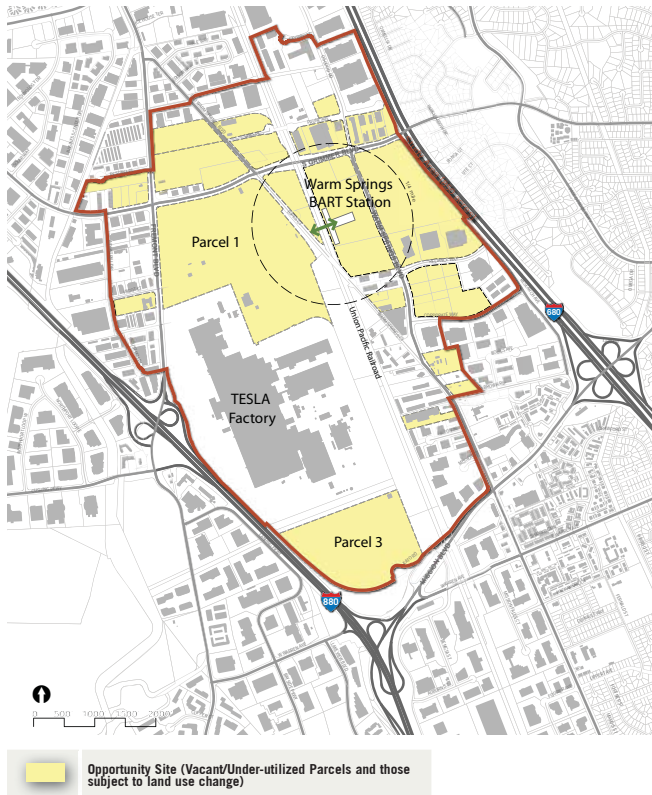
For the purposes of this Study, and particularly in laying out potential locations for residential uses, the following assumptions on the size (width) of buffers were established:

- Railroad Buffer: 500-foot setback from rail
- Freeway Buffer: 500-foot setback from Interstates 680 and 880, consistent with the California Air Resources Board “Air Quality and Land Use Handbook: A Community Health Perspective” and the San Francisco Department of Public Health’s “Healthy Development Measurement Tool”.
- Industrial Buffer: 800-meter buffer for initial evacuation distances for railcar sized incidents involving flammable liquids; 800-meter buffer for cryogenic Hydrogen; and 1,600-meter if larger tanks are involved.



To protect from poor air quality and transport of hazardous materials, residential uses will need to be set back from the railroad, freeways and hazardous industrial sites.

Figure 2.1 Opportunity Sites



Vacant and Underutilized Lands

Illustrated in **Figure 2.1**, the Study Area includes a large number of vacant and underutilized lands (i.e., parcels with uses that do not maximize the allowed intensity of the industrial zoning), creating opportunity sites for new development. The largest vacant parcels are the Union Pacific owned Parcels 1 and 3, north and south of the Tesla factory respectively, and parcels adjacent to the planned BART station. Parcel 1 and those adjacent to the BART Station offer opportunities for a jobs-focused or housing-focused TOD. It should be noted that Parcel 1 would likely include a minimum 15-acres of rail-related uses, operated by Union Pacific Railroad, adjacent to the Tesla factory. In addition to the vacant and underutilized lands, the Study Area includes other parcels subject to land use change, based on private party interest in land use conversion. **Figure 2.1** illustrates all lands that may be considered opportunity sites for purposes of this Study. All other parcels are anticipated to remain in industrial operations for the foreseeable future.

Explained in more detail below (see Land Use Categories and Metrics), the opportunity sites are used to calculate future jobs and development growth based on established land use metrics.

TOD at BART

The planned Warm Springs BART extension and station, now under construction, offers opportunities for Transit-Oriented Development (TOD) generally within ¼ to ½ mile of the station. The TOD can be jobs-focused or housing-focused, with a greater density of development near the station critical for maximizing transit use and minimizing automobile use. The parcels near the station are appropriate for office and R&D uses, including a high-tech corporate campus, and/or a high-density residential neighborhood. Retail is best integrated into the overall TOD district, and it should have visibility along Grimmer Boulevard.

Strong pedestrian/bike connections to the station from throughout the Study Area, particularly related to housing, are important for the success of the BART station and TOD district. A pedestrian/bicycle crossing through the BART station and over the railroad tracks is essential for connecting the BART station with parcels and businesses west of the tracks. For the entire Study Area, the planned BART station offers a convenient alternative for commuters.

Residential – Critical Mass

As noted above, the industrial character of the Study Area offers challenges for locating residential uses in this area. In addition, the area is isolated from other residential neighborhoods in Fremont, which can result in safety concerns (e.g. truck traffic during the day, abandoned streets at night, fewer “eyes on the street”) and lack of services (e.g. lack of stores, playgrounds, parks, schools, and other community facilities). On the other hand, the planned BART station offers opportunities for a higher-density mixed-use TOD district. Under these circumstances, it is essential that a critical mass of housing be provided to create a high-quality residential neighborhood, one that is large and dense enough to create a self-sufficient residential community, with a range of housing choices, which can support parks, other common area amenities, and some increment of daily needs shopping.

For purposes of this Study, 2,500 residential units are targeted to be located near, ideally $\frac{1}{4}$ mile from, the planned BART station. The housing type should be higher density but offer enough variety to accommodate a range of household types, including families. A mixed-use residential neighborhood of this type would nicely complement adjacent innovative industries, creating a live-work district in this portion of Fremont. It is important that buffers exist between the residential enclave and industrial uses along with setbacks from the rail line and freeway. Such buffers can take the form of office and office/R&D development in addition to open space.

Three housing types are considered for this area:

- Two- to three-story town homes, built at 20 to 30 units per acre, with an at-grade entry and garage.
- Four-story stacked flats or town homes, built at 30 to 50 units per acre, with grouped parking or a ground-level podium parking garage. This housing type could be a “3 over 1” configuration (assuming ground-level podium parking), with three levels of Type V-A (wood frame) construction over one level of Type 1 (concrete) construction, with a building height not to exceed 50 feet. Alternatively, this housing type could be housing wrapped around a central parking structure.
- Five-story stacked flats or town homes, built at 50 to 70 units per acre, on top of a ground-level podium parking garage. This housing type could be a “4 over 1” configuration, with four levels of Type V-A (wood frame) construction over one level of Type 1 (concrete) construction, with a building height not to exceed 50 feet. Alternatively, this housing type could be housing wrapped around a central parking structure.

For this Study in Alternatives 2 and 3, the higher density housing east of the station would be 50% four-story stacked town homes and 50% five-story stacked flats. In Alternative 3, a slightly broader range of housing types is applied to Parcel 1 west of the tracks, that is $\frac{1}{3}$ town homes, $\frac{1}{3}$ four-story stacked town homes, and $\frac{1}{3}$ five-story stacked flats.

3. LAND USE CATEGORIES AND METRICS

Categories

The land use categories applied to the three land use alternatives are based on those in the draft General Plan 2030. The category definitions below, paraphrased from the draft General Plan 2030, are modified as appropriate for the Study Area.

Industrial – General Industrial/Manufacturing (General Industrial)



Fremont contains one of the few remaining large industrial areas within the Bay Area, and with Tesla now occupying the former NUMMI plant, it is important to allow industrial uses to continue to be viable in this area. (Fremont, CA)

This industrial designation accommodates a broad range of uses and recognizes the greater potential of these uses to generate off-site impacts, including noise, odors, vibration, and truck traffic. Such uses include heavy manufacturing, warehousing, recycling facilities, and corporation yards, as well as uses which require handling and storage of hazardous materials, which may make it potentially incompatible with uses such as retail, office, and group assembly. Buffers and screening may be required to ensure land use compatibility between general industrial/manufacturing uses and its adjacent areas. A maximum FAR of 0.35 applies.

It should be noted that in each alternative, a minimum 15-acres of rail-related uses may occur on Parcel 1 that may alter long-term build-out on that parcel. If this were to occur, employment and development assumptions may potentially be relocated to other portions of the parcel or Study Area.

Industrial – Technology/Research & Development (R&D)



Example of new manufacturing facilities replacing an old GM plant in San Fernando Valley. (Los Angeles, CA)

This industrial designation accommodates uses related to technology and its research and development, including administrative, sales, and engineering facilities. Warehousing, wholesaling, and distribution facilities may also be located in these areas. Manufacturing and moderate levels of hazardous materials handling and storage may be permitted, provided that they do not generate significant off-site impacts, such as noise, vibration, and odor. A maximum FAR of 0.35 applies, up to 0.45 permitted for manufacturing and warehouse uses.

Commercial/Industrial – Office/Research & Development (R&D)

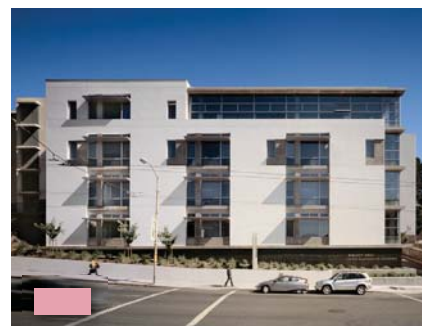


University Park at MIT is an example of a successful urban renewal project with mixed-use residential, retail, office, and biotech labs all sharing one district and a large open space. (Cambridge, MA)

This blended land use category accommodates both commercial and industrial designations, and it allows for a broad range of uses that are related to research and development, from more moderate industrial uses associated with manufacturing, warehousing, and distribution of materials to commercial office. Moderate levels of hazardous materials handling and storage may be permitted, provided that they do not generate any off-site impacts, such as noise, vibration, and odor. Unlike the Technology/R&D designation, this blended category would support higher value and potentially more intensive R&D development, along with office development. This land use category also accommodates special uses, such as entertainment, community facilities, and hotels, and vertical mixed-use development, with commercial space over ground-floor retail and services. A maximum FAR of 0.75 applies.

Commercial High Tech Office

This commercial designation accommodates office uses related to technological development, including administrative, sales, and other professional services. Warehousing and manufacturing facilities are discouraged and uses which generate off-site impacts, including noise, odors, and vibrations are not permitted in these areas as they may be incompatible with adjacent land uses. This land use category also accommodates special uses, such as entertainment, community facilities, and hotels, and vertical mixed-use development, with commercial space over ground-floor retail and services. The commercial high tech office areas should be characterized by a campus-like environment, with architectural and landscape standards, to maintain high standards of visual quality. A maximum FAR of 1.50 applies.



Architectural and landscape standards can help create a desirable campus-like quality for commercial office development. (San Francisco, CA)

Commercial – Retail Center

This commercial designation accommodates neighborhood retail and office uses, including supermarkets, drug stores, restaurants, banks, medical and dental offices, and miscellaneous small local-serving stores and services. It mainly services the day-to-day needs of local Fremont residents and workers and is located along the main thoroughfares and collector streets. A maximum FAR of 0.3 applies.



Neighborhood commercial retail center (Santa Clara, CA)

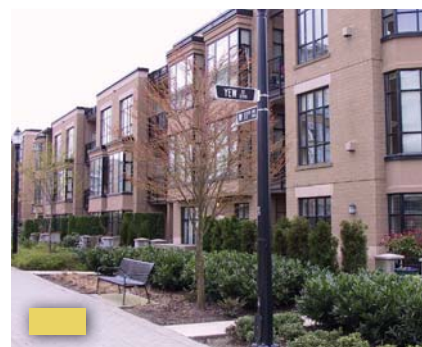
Residential – High Density

Three types of housing are considered for this area, consistent with Transit Oriented Development (TOD):

- Medium Density Residential: Two-to-three story town homes, built at 20 to 30 units per acre.
- Urban-Medium Density Residential: Four story stacked town homes, built at 30 to 50 units per acre.
- Urban-High Density Residential: Five story stacked flats on top of a ground-level podium parking garage, built at 50 to 70 units per acre.

Medium Density Residential (20 to 30 units per net acre)

The Medium Density Residential applies to housing that is generally multi-family in character such as garden apartments, condos, flats, townhouses, and low-rise multi-family complexes. These areas retain some characteristics of a suburban neighborhood, such as landscaped yards, off-street parking, common open space, and low building heights with surface parking. Correlating zoning includes the R-3 district zones and the R-G zone.



Medium density townhomes. (San Jose, CA)

Urban Residential (30 to 70 units per net acre)

The Urban-Medium and Urban-High Residential designation applies to stacked townhomes and flats that are four to five stories in height, with structured or podium parking. Common open space and other shared amenities are typically provided on larger parcels with these designations. Correlating zoning in Urban Residential areas includes the higher density R-3 zones and the proposed R-4 zone.

All residential land use areas permit compatible uses such as schools, child care centers, and religious facilities. The land use category also accommodates special uses, such as entertainment, community facilities, and hotels, and vertical mixed-use development, with residential space over ground-floor retail, services, and small offices. Such vertical mixed-use development would be most appropriate around the BART station.



Mixed-use residential developments can accommodate ground floor retail. (San Jose, CA)



Open space can include small pocket parks that serve the immediate neighborhood. (Portland, OR)

Open Space

This open space designation includes parks that are currently owned and operated by the City, as well as land intended to become City parks in the future. The appropriate uses are based on the park's classification and standards, further defined in the City's Parks Master Plan and the General Plan Parks and Recreation Element. These areas can include active and passive recreation areas, such as athletic fields, playgrounds, trails, tennis courts, and recreation centers. A maximum height limit of 35 feet, and an impervious surface coverage limit of 15 percent, applies with some exceptions allowed.

Special Uses

Of the seven land use categories mentioned, three of them – Commercial/Industrial–Office/R&D, Commercial High Tech Office, and Residential-High Density – can also accommodate what this Study is calling “special uses,” which are uses recommended by the community and City Council as possible desirable uses for the Study Area. Special uses can integrate well with the aforementioned land use categories, enhancing the area as a community hub and destination. The special uses might include:

- Regional Destination, such as a ballpark, amusement park, or other regional attractions.
- Entertainment, such as a movie theater and associated leisure recreation activities.
- Community Facility, such as a cultural arts center, library, or other form of public gathering space.
- Convention Facility, such as conference centers.
- Education, including new schools, partnerships with existing educational facilities and skills centers.
- Hotel



Special uses might include an educational or training facility (above), or hotel (below).

Methodology and Metrics

The land use alternatives (see Land Use Alternatives section) illustrate proposed changes in land use in the Study Area, reflecting potential new development, housing units, and jobs. For the purposes of this planning-level Study, development growth and future jobs are calculated for the opportunity sites only (see **Figure 2.1**), using established land use metric assumptions for various land use categories (see **Table 3.1**). The other “non-opportunity” sites are anticipated to remain in industrial use. The calculation of development area (square footage) and job growth for non-industrial lands (for the various commercial land use categories), where new roads may be introduced, assumes that 20% of the land will be set aside for roadways and is, therefore, not available for development. Calculations for industrial lands and residential development are completed on gross acreage.


For each land use category, development metrics were developed and used to calculate new non-residential construction (i.e. square footage), new residential units, and new jobs for each alternative. For the two industrial categories and commercial-retail center, the square footage calculated is based on maximum allowable Floor Area Ratio (FAR). For commercial/industrial – high tech office/R&D blend and commercial-high tech office, square footages were calculated based on a range of FAR, since a higher variability of building types and uses are anticipated for those areas. Approximate total residential units were calculated based on the number of acres anticipated for each of the three housing type represented in Alternative 2 and Alternative 3. **Table 3.2** summarizes the assumptions made about the distribution of housing types in the Study Area.

Table 3.1: Preliminary Land Use Metric Assumptions

		Industrial - General/ Manufacturing	Industrial - Technology/ R&D	Commercial/ Industrial - High Tech Office/ R&D Blend	Commercial - High Tech Office	Commercial - Retail Center	Residential - High Density (includes support retail, schools)
Jobs per Acre Metric	<i>low</i>	15	35	50	100	40	-
	<i>high</i>	25	35	100	250	40	-
Square Footage Metric (FAR)	<i>low</i>	0.35	0.35	0.40	0.60	0.30	-
	<i>high</i>	0.35	0.35	0.75	1.50	0.30	-
Residential DU/ Acre Metric	<i>low</i>	-	-	-	-	-	20 to 30 du/acre
	<i>mid</i>	-	-	-	-	-	30 to 50 du/acre
	<i>high</i>	-	-	-	-	-	50 to 70 du/acre

Table 3.2: Preliminary Residential Metric Assumptions

Alternative	Gross Residential Acreage	Residential Type	Proposed Ratio for each Housing Type
Alternative 2 - Residential East of Tracks	53	20-30 du/acre	0%
		30-50 du/acre	50%
		50-70 du/acre	50%
Alternative 3 - Residential East of Tracks	35	20-30 du/acre	0%
		30-50 du/acre	50%
		50-70 du/acre	50%
Alternative 3 - Residential West of Tracks	37	20-30 du/acre	33%
		30-50 du/acre	33%
		50-70 du/acre	33%



The Bay Meadows redevelopment district integrates office space with a downtown retail and urban density housing, along with several parks, playfields, and festive gathering spaces, to form a cohesive and distinctive neighborhood. (San Mateo, CA)



4. LAND USE AND DESIGN PRINCIPLES

While this Land Use Alternatives Study focuses on uses in the Study Area, the ultimate success of the area will rely on the quality of both the private and public realms. Some of the broad principles for a high-quality built environment are summarized below. However, a more thorough set of design concepts, guidelines and standards will be developed for the Study Area in subsequent planning efforts by the City.

Place-Making

Most successful places, in terms of vibrancy and economic vitality, have a recognizable identity in terms of land use and character. Employing the highest urban design standards, the Study Area has the potential to become a District of Innovation and a place for community life. Such places tend to have a well-defined public realm, in terms of streets and open space, a unifying street and landscape character, and high-quality architecture that address and frame the streets and open space. Within the Study Area, the area within ½ mile of the planned BART station can become a recognizable center and hub for the area, with a rich mix of land uses, commercial and R&D enterprises and high-density housing, with a variety of unit types, organized around a network of streets and community spaces. Special uses, such as a “tech shop,” technical school or community center, can create synergies with other innovative land uses in the area. Mission Bay in San Francisco is one such example, where a UCSF campus in combination with biotech companies create a center of biotechnology and innovation, all built within a framework of high-quality streets and open space. With careful planning, the Study Area has the potential to set a model for a high quality planned industrial zone with a mix of non-industrial uses.



The University Park project in Cambridge, MA organizes a variety of high-tech uses, hotels, and residential developments around a central open space, providing a high-quality identity for the district. (Cambridge, MA)



South Fremont/Warm Springs has potential to be accommodating for both industrial and R&D uses, as well as providing a place that fosters community identity by allowing a variety of land uses and network of pedestrian-friendly streets. (Davis, CA)



Tanner Springs Park is an example of a former industrial area transformed into a neighborhood pocket park that re-introduces natural wetlands and vegetation. (Portland, OR)



Jamison Square is an example of a neighborhood plaza which provides outdoor seating, spaces for passive recreation, as well as a children's play area. (Portland, OR)

Public Space

Public spaces, including privately-owned publicly-accessible open spaces (POPAS), become important components in creating a sense of place and building community. If well designed, they offer a place for recreating, respite, renewal and social interaction. Publicly-accessible spaces, whether outdoor or indoor, afford opportunities for informal gathering and chance interactions, including opportunities for exchange of ideas, much like the open space and quads of a college campus. Outdoor public space comes in the form of parks and streets, including ample sidewalk space for outdoor seating, landscaping and, in some cases, outdoor seating for cafés and restaurants.

Within the Study Area, the area leading to and nearest the planned BART Station can become a place for well-designed public spaces, supporting synergistic activities in innovation, providing recreation for office workers and neighborhood residents, and treating storm water run-off.

Mobility

Mobility options which provide efficient, attractive and convenient alternatives to single occupant automobiles, and meet the full service needs of all users, are an important component to the revitalization of the Study Area. Mobility must address the needs of industry, including truck access, while offering other modes of circulation that serve other users in the area. These other modes include an attractive and inviting network of bicycle pathways, pedestrian pathways, and transit and shuttle access. Mobility, and pedestrian orientation in general, also speak to the character and scale of blocks and streets.

Within the Study Area, a variety of attractive mobility options to the planned BART station can enhance the viability of the area. They include a bike/pedestrian crossing over the Union Pacific railroad tracks and shuttle service connecting surrounding businesses to the station. The introduction of a smaller-grain street pattern, particularly in the area nearest the planned BART station, would afford pedestrian activity. Pedestrian linkages to the Tesla factory, and other industries in the area, would support non-vehicular use. Other bike/pedestrian linkages include City plans for a bicycle and pedestrian trail along the Union Pacific Railroad corridor, some of which are abandoned and others that are still active rail corridors.



Mobility in the Study Area must address a variety of needs, including the increasing bicyclist community in Fremont and those who will be commuting by bike from BART.



A modern pedestrian and bike bridge crossing at the Pleasant Hill BART Station.

5. LAND USE ALTERNATIVES

Alternative 1: Innovation Center/Manufacturing



Example of new manufacturing facilities replacing an old GM plant in San Fernando Valley. (Los Angeles, CA)



Motorola's China headquarters is an example of a commercial/industrial blend building, with landscaped setbacks, in an Economic and Technological Development Zone. (Beijing, China)



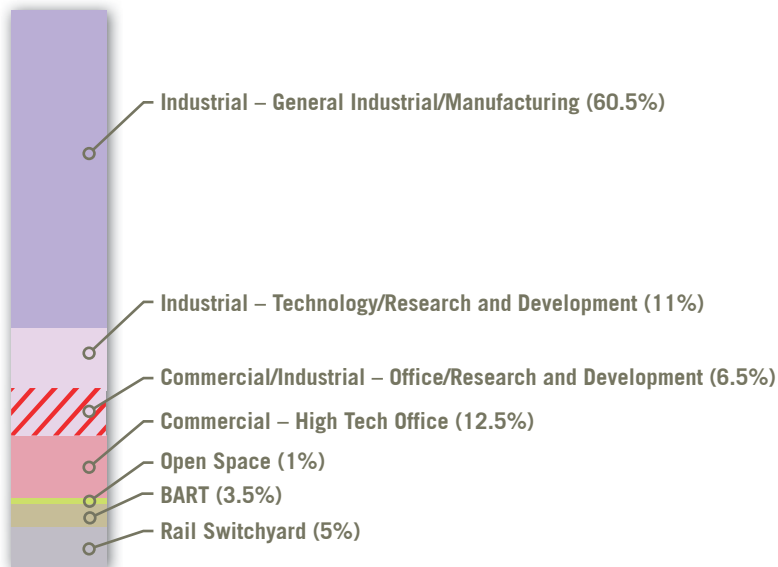
An office campus for Nike's headquarters (Beaverton, OR)

Alternative 1 retains the Study Area for industrial and commercial uses only, creating a Center for Innovation in manufacturing processes, including the Tesla factory, related industries and other high-tech/green-tech companies. This alternative focuses general industrial and manufacturing mostly west of the railroad and locates a commercial district, accommodating a potential high-tech office campus, near the planned BART station. The commercial area and adjacent R&D could be closely linked to innovations in manufacturing in the nearby industrial areas, with the Tesla factory as an anchor. A pedestrian/bicycle crossing through the BART station and over the railroad tracks, and nearby open space amenities, connect the two sides of the commercial/R&D-focused TOD. In this alternative, this jobs-focused TOD would complement the residential-focused TOD's at BART stations north, and potentially south, of the station, providing work places for those living near other BART stations.

Alternative 1, with only industrial and commercial uses, does not introduce conflicts with non-industrial/commercial uses and keeps a singular focus on innovation and jobs. Because this alternative does not include residential uses, it would not result in a mixed-use residential neighborhood.

Land Uses

For the entire Study Area



New Development

On existing vacant and under-utilized parcels and those subject to land use change

NON-RESIDENTIAL SQUARE FOOTAGE: from 5,700,000 sf to 9,000,000 sf

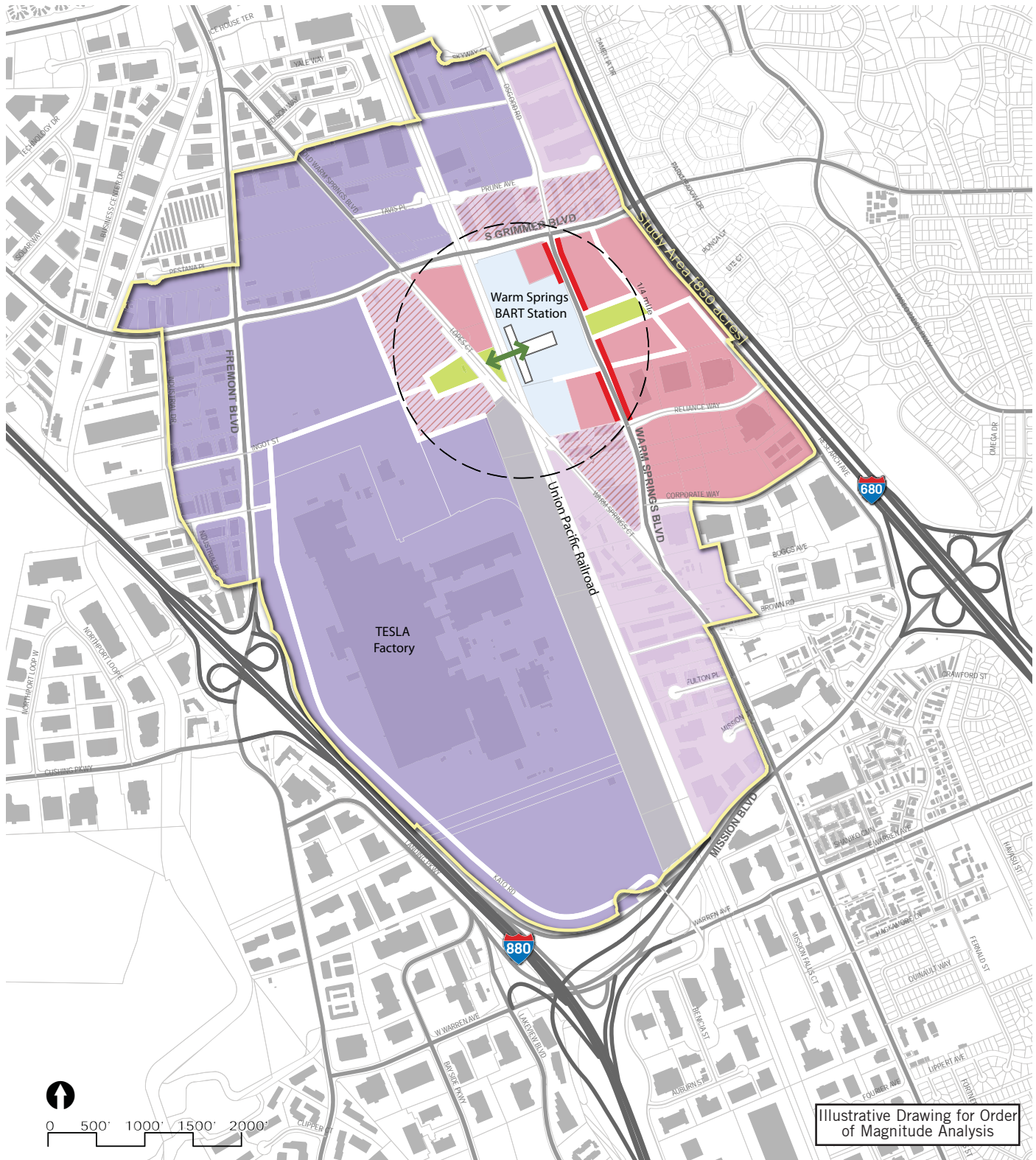


JOBS: from 12,300- 26,600 jobs



RESIDENTIAL UNITS: 0 units

Figure 5.1: Land Use Alternative 1 - Innovation Center/Manufacturing

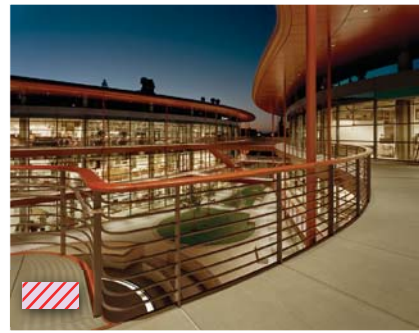


	Industrial - General Industrial/Manufacturing		Commercial - Retail Center		BART
	Industrial - Technology/Research & Development		Residential - High Density (Includes support services such as retail, schools, and parks)		Railroad / Railyard
	Commercial/Industrial - Office/Research & Development (Could include Special Uses such as entertainment, community facilities, and hotels)		Open Space		
	Commercial High Tech Office (Could include Special Uses such as entertainment, community facilities, and hotels)		Retail Frontage		

Note: A minimum of 15 acres of rail-related uses may be developed on Parcel 1, which could affect long-term build-out. If this were to occur, employment and development assumptions may potentially be relocated to other portions of the Study Area.

Alternative 2 establishes a large innovation campus, with a mix of commercial and R&D, west of the planned BART Station, affording potential synergies with adjacent industrial enterprises, including Tesla. It also locates all general industrial and manufacturing uses, and their related “hazards,” west of the tracks. This alternative places a high-density TOD residential neighborhood with complementary ground-floor retail at the planned BART station east of the railroad tracks, with surrounding office and R&D providing jobs and a buffer for the residential neighborhood. The areas east and west of the planned BART station are linked by a bicycle/pedestrian crossing through the BART station and over the railroad tracks. A finer-grain street pattern, with open space corridors and parks, reinforces the pedestrian-oriented character of both the innovation campus and the residential neighborhood.

For the entire Study Area



New Development

On existing vacant and under-utilized parcels and those subject to land use change

NON-RESIDENTIAL SQUARE FOOTAGE: from 4,400,000 sf to 6,900,000 sf



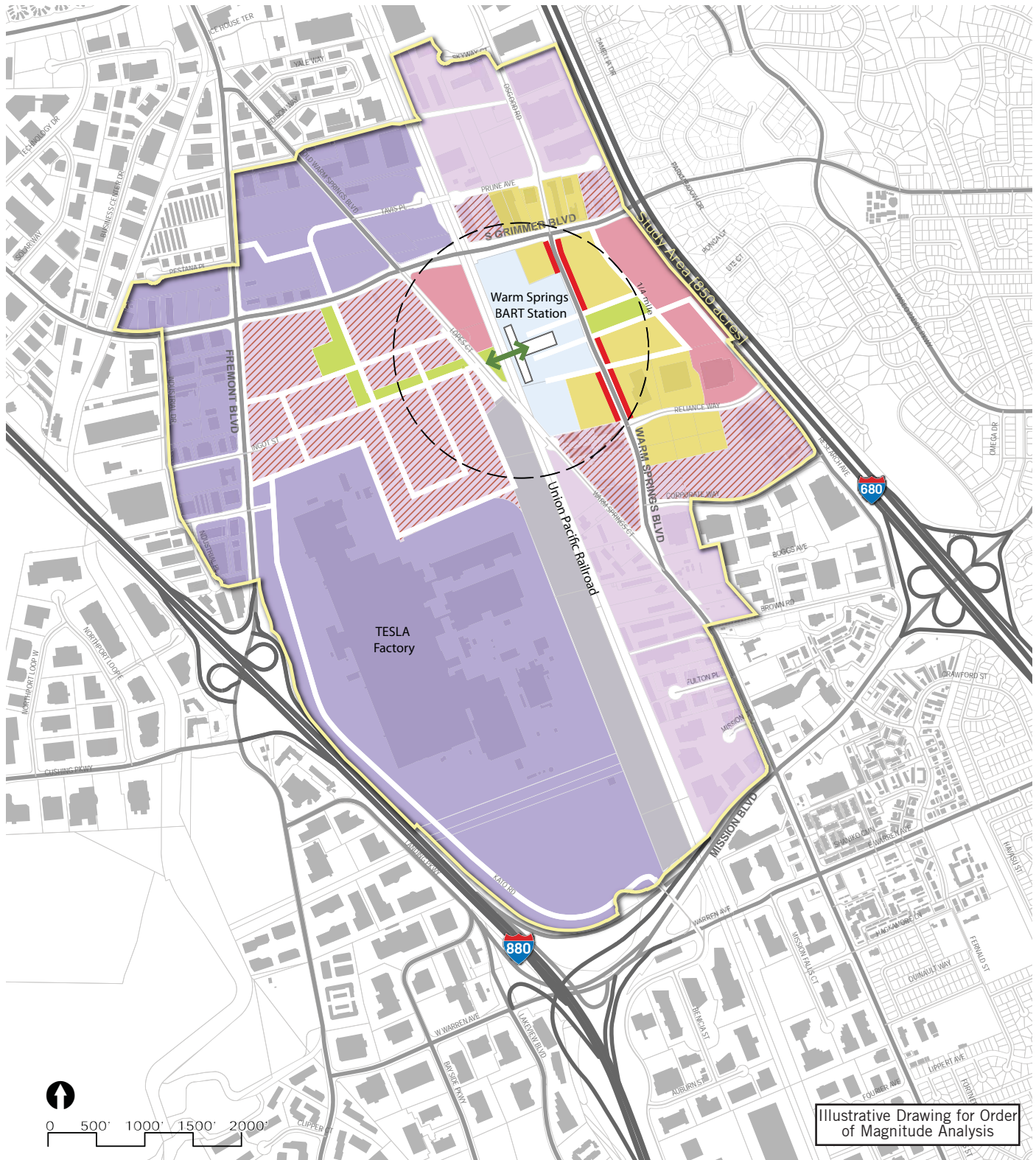
JOBS: from 9,700 - 19,700 jobs













RESIDENTIAL UNITS: from 2,100 - 3,200 units



Figure 5.2: Land Use Alternative 2 - Innovation Campus/Residential TOD



	Industrial - General Industrial/Manufacturing		Commercial - Retail Center		BART
	Industrial - Technology/Research & Development		Residential - High Density (Includes support services such as retail, schools, and parks)		Railroad / Railyard
	Commercial/Industrial - Office/Research & Development (Could include Special Uses such as entertainment, community facilities, and hotels)		Open Space		
	Commercial High Tech Office (Could include Special Uses such as entertainment, community facilities, and hotels)		Retail Frontage		

Note: A minimum of 15 acres of rail-related uses may be developed on Parcel 1, which could affect long-term build-out. If this were to occur, employment and development assumptions may potentially be relocated to other portions of the Study Area.



Example of biotech lab space with commercial office in a mixed-use district. (Cambridge, MA)



A small neighborhood commercial retail center can provide amenities and serve the day-to-day needs of local residents and workers. (Mountain View, CA)



Ground-floor retail frontage along Warm Springs Boulevard, near the future BART station, could enhance the community quality of life. (San Jose, CA)



Residential units in the area west of the tracks might include two-to-three story townhomes, built at 20 to 30 units per acre. (Denver, CO)

Alternative 3: Innovation District/Residential Mixed-Use

Alternative 3 establishes a mixed-use living and working district, with two high-density TOD residential neighborhoods both west and east of the planned BART station. A mix of office and R&D surrounds the residential neighborhoods, creating jobs for residents and potential synergies with nearby industries. The office and R&D also buffer residential uses from nearby industrial activities. Grimmer Boulevard, lined with new office/R&D and residential uses, creates a new character for the district, becoming a high-visibility “front door” for the area. This alternative also incorporates a retail center at the corner of Grimmer and Fremont Boulevards, serving the larger area and the adjacent residential neighborhood.

Alternative 3 envisions the two residential neighborhoods having distinct characters, with the neighborhood west of the tracks having a broader range of residential types (i.e., town homes, stacked town homes, and stacked flats up to five stories), while the neighborhood east of the planned BART station having a higher-density character (i.e., stacked town homes and stacked flats). The two neighborhoods are linked by a bicycle/pedestrian crossing through the BART station and over the railroad tracks. As with Alternative 2, a finer-grain street pattern, with open space corridors and parks, reinforce the pedestrian-oriented character of the mixed-use/residential neighborhoods.

Land Uses

For the entire Study Area



New Development

On existing vacant and under-utilized parcels and those subject to land use change

NON-RESIDENTIAL SQUARE FOOTAGE: from 4,000,000 sf to 6,700,000 sf



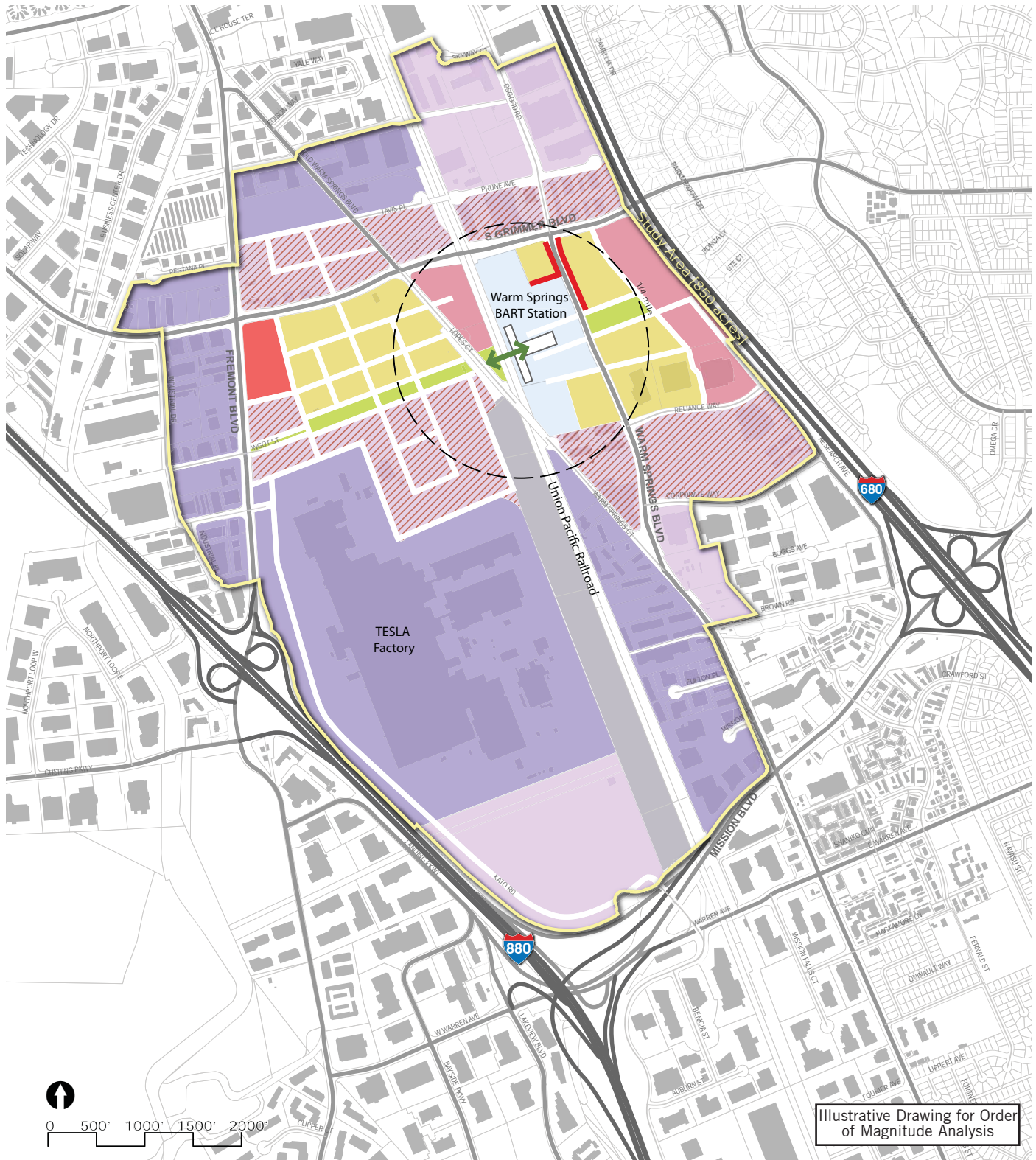
JOBS: from 10,800 - 20,400 jobs



RESIDENTIAL UNITS: from 2,600 - 3,900 units



Figure 5.3: Land Use Alternative 3 - Innovation District/Residential Mixed-Use



	Industrial - General Industrial/Manufacturing		Commercial - Retail Center		BART
	Industrial - Technology/Research & Development		Residential - High Density (Includes support services such as retail, schools, and parks)		Railroad / Railyard
	Commercial/Industrial - Office/Research & Development (Could include Special Uses such as entertainment, community facilities, and hotels)		Open Space		
	Commercial High Tech Office (Could include Special Uses such as entertainment, community facilities, and hotels)		Retail Frontage		

Note: A minimum of 15 acres of rail-related uses may be developed on Parcel 1, which could affect long-term build-out. If this were to occur, employment and development assumptions may potentially be relocated to other portions of the Study Area.

6. APPENDIX: PARCEL ACREAGE CALCULATIONS

The following tables and figures provide background parcel and acreage information used in calculating land use allocations and new development (on existing and under-utilized parcels) for the three land use alternatives. The parcel numbers on the table opposite correspond to the parcel division maps that follow.

Perkins + Will
6 September 2011
Parcel Acreage Calculations

Parcel	Opp Site?	Alternative 1		Alternative 2		Alternative 3	
		Acres	Land Use	Acres	Land Use	Acres	Land Use
Parcel 1							
1A	y	66.7	Ind Gen	77.5	Comm/Ind	8.1	Comm Retail
1B	y	23.5	Comm/Ind	8.9	OS	37.1	Residential
1C	y	2.9	OS	20.8	Comm/Ind	4.8	Comm/Ind
1D	y	14.1	Ind Gen	0.0	-	9.1	OS
1E	y	0.0	-	0.0	-	48.1	Comm/Ind
Subtotal		107.2		107.2		107.2	
Parcel 2							
2	n	209.2	Ind Gen	209.2	Ind Gen	209.2	Ind Gen
Subtotal		209.2		209.2		209.2	
Parcel 3							
3	y	52.0	Ind Gen	52.0	Ind Gen	52.0	Ind Tech
Subtotal		52.0		52.0		52.0	
Parcels West of Fremont Blvd							
4A	n	4.1	Ind Gen	4.1	Ind Gen	4.1	Ind Gen
4B	y	9.0	Ind Gen	9.0	Ind Gen	9.0	Ind Gen
5	n	21.3	Ind Gen	21.3	Ind Gen	21.3	Ind Gen
6A	y	4.3	Ind Gen	4.3	Ind Gen	4.3	Ind Gen
6B	n	3.9	Ind Gen	3.9	Ind Gen	3.9	Ind Gen
7	n	6.8	Ind Gen	6.8	Ind Gen	6.8	Ind Gen
Subtotal		49.5		49.5		49.5	
Parcel 8							
8A	n	5.2	Ind Gen	5.2	Ind Gen	5.2	Ind Gen
8B	y	11.1	Ind Gen	11.1	Ind Gen	11.1	Comm/Ind
8C	y	21.8	Ind Gen	21.8	Ind Gen	21.8	Comm/Ind
Subtotal		38.1		38.1		38.1	
Parcels North of Grimmer, Between Old Warm Springs and Tracks							
9A	y	12.8	Ind Gen	12.8	Ind Gen	12.8	Ind Gen
9B	n	5.7	Ind Gen	5.7	Ind Gen	5.7	Ind Gen
10	y	5.9	Ind Gen	5.9	Ind Gen	5.9	Comm/Ind
Subtotal		24.4		24.4		24.4	
11	n	13.0	Ind Gen	13.0	Ind Tech	13.0	Ind Tech
12A	n	14.3	Ind Gen	14.3	Ind Tech	14.3	Ind Tech
12B	y	2.6	Ind Gen	2.6	Ind Tech	2.6	Ind Tech
13A	y	9.0	Comm/Ind	4.4	Comm/Ind	4.4	Comm/Ind
13B	y	0.0	-	4.6	Residential	4.6	Comm/Ind
14	n	16.9	Ind Tech	16.9	Ind Tech	16.9	Ind Tech
15A	y	8.4	Comm/Ind	4.6	Residential	4.6	Comm/Ind
15B	y	0.0	-	3.8	Comm/Ind	3.8	Comm/Ind
Subtotal		64.2		64.2		64.2	
Parcel 16							
16A	y	8.2	Commercial	8.2	Commercial	8.2	Commercial
16B	y	1.0	OS	1.0	OS	1.0	OS
Subtotal		9.2		9.2		9.2	
Parcel 17							
17A	y	28.3	BART	28.3	BART	28.3	BART
17B	y	2.9	Commercial	2.9	Residential	2.9	Residential
17C	y	5.3	Commercial	5.3	Residential	5.3	Residential
Subtotal		36.5		36.5		36.5	
Parcel 18							
18A	y	50.3	Commercial	24.0	Commercial	24.0	Commercial
18B	y			8.5	Residential	8.5	Residential
18C	y	3.9	OS	3.9	OS	3.9	OS
18D	y	0.0	-	17.9	Residential	17.9	Residential
Subtotal		54.2		54.2		54.2	

Perkins + Will
6 September 2011
Parcel Acreage Calculations

Parcel	Opp Site?	Alternative 1		Alternative 2		Alternative 3	
		Acres	Land Use	Acres	Land Use	Acres	Land Use
Parcels South of Reliance Way, East of Tracks							
19A	n	4.8	Comm/Ind	4.8	Comm/Ind	4.8	Comm/Ind
19B	y	4.0	Comm/Ind	4.0	Comm/Ind	4.0	Comm/Ind
19C	n	2.8	Comm/Ind	2.8	Comm/Ind	2.8	Comm/Ind
20A	y	9.0	Commercial	9.0	Residential	9.0	Comm/Ind
20B	y	12.4	Commercial	12.4	Comm/Ind	12.4	Comm/Ind
20C	n	11.5	Commercial	11.5	Comm/Ind	11.5	Comm/Ind
21A	n	4.5	Ind Tech	4.5	Ind Tech	4.5	Ind Tech
21B	y	4.8	Ind Tech	4.8	Ind Tech	4.8	Ind Tech
21C	n	1.6	Ind Tech	1.6	Ind Tech	1.6	Ind Tech
21D	y	2.2	Ind Tech	2.2	Ind Tech	2.2	Ind Tech
22	n	24.5	Ind Tech	24.5	Ind Tech	24.5	Ind Gen
23A	y	4.8	Ind Tech	4.8	Ind Tech	4.8	Ind Gen
23B	n	28.3	Ind Tech	28.3	Ind Tech	28.3	Ind Gen
Subtotal		115.2		115.2		115.2	
Parcel 24							
24	n	40.6	Railyard	40.6	Railyard	40.6	Railyard
Subtotal		40.6		40.6		40.6	
TOTAL		800.3		800.3		800.3	

Land Use Calculation - Opportunity Sites	Alt 1	Alt 2	Alt 3
	(ac)	(ac)	(ac)
Industrial - General Industrial/Manufacturing	200	117	31
Industrial - Technology/Research & Development	12	14	62
Commercial/Industrial - Office/Research & Development	45	123	135
Commercial High Tech Office	88	32	32
Commercial - Retail Center	-	-	8
Residential - High Density	-	53	72
Open Space	8	14	14
BART	28	28	28
TOTAL	381	381	381

Figure A.1: Parcels Division: Alternative 1

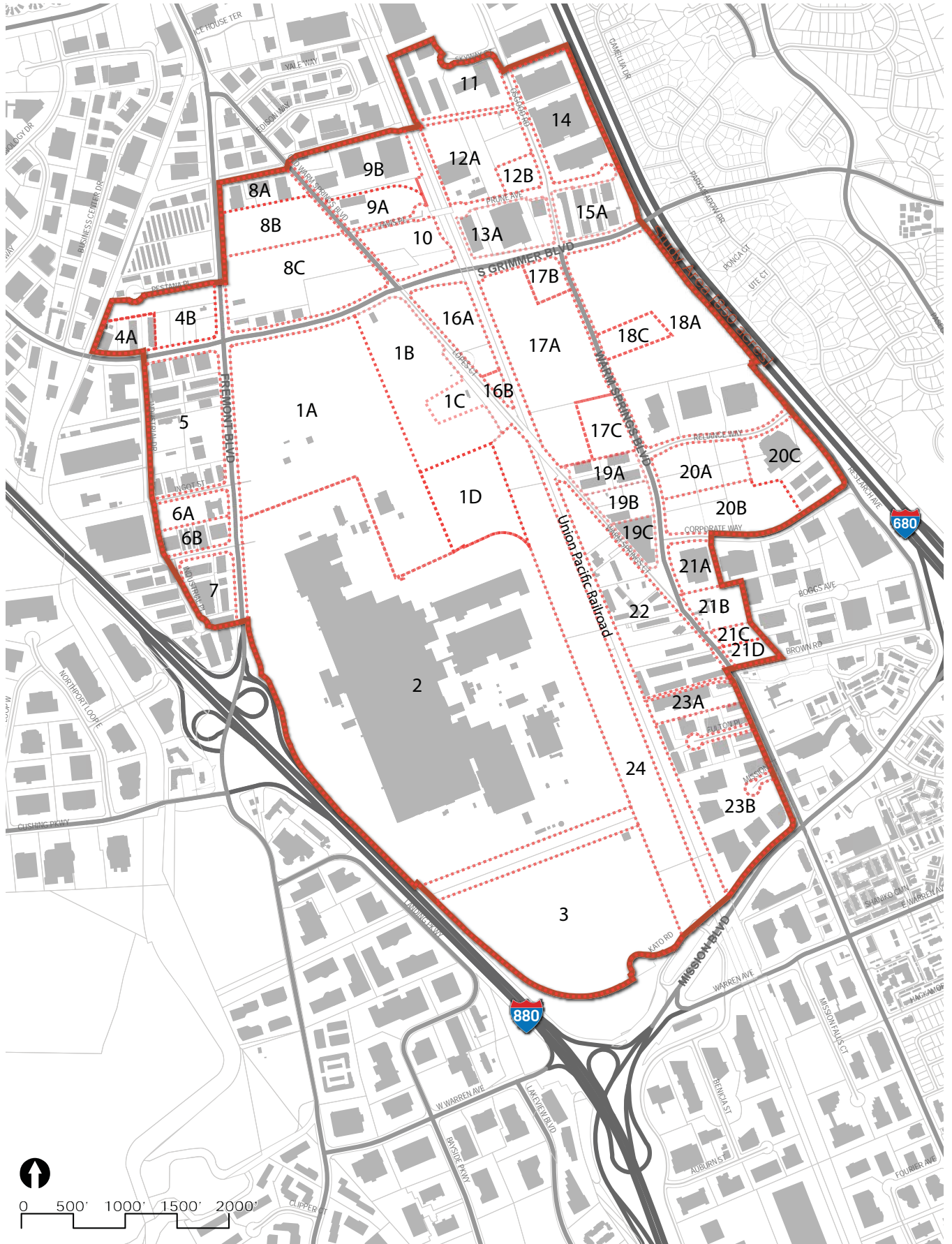
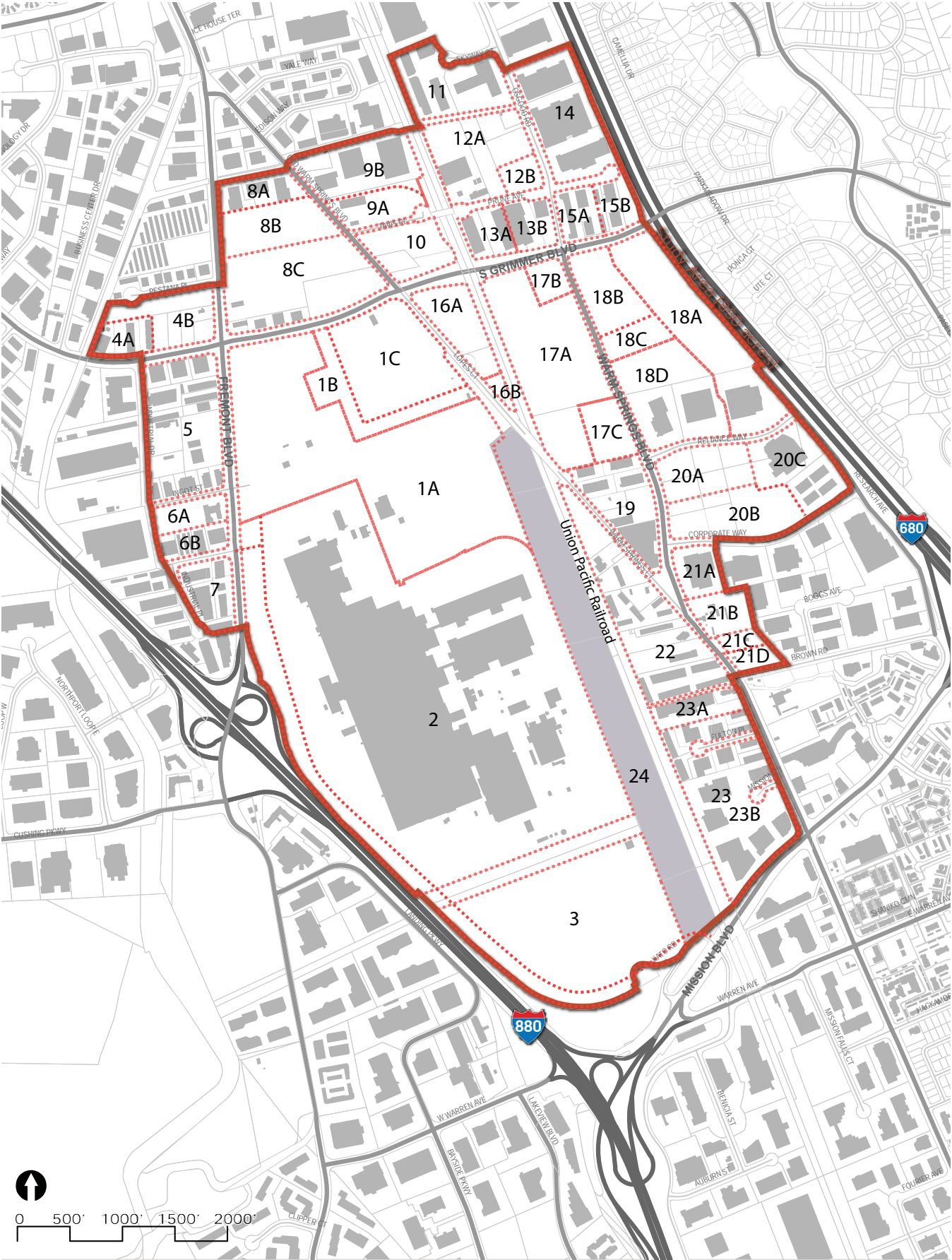


Figure A.2: Parcels Division: Alternative 2



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